



Frequently Asked Questions About Water Reclamation and Reuse

1. What is reclaimed water?

Reclaimed water is wastewater, stormwater or gray water that is treated to remove pollutants and pathogens which are potentially harmful to the environment or human health. Reclaimed water can be reused in a variety of ways for purposes that typically don't require drinking water quality. The greater the potential for public contact with reclaimed water for a particular reuse, the more treatment and disinfection the water will require to protect public health.

2. What is the difference between wastewater, gray water and stormwater for water reuse?

Wastewater is untreated liquid containing domestic sewage and industrial waste. Wastewater comes from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions.

Gray water is untreated household wastewater from bathtubs, showers, lavatory fixtures, wash basins, washing machines and laundry tubs. It does not include wastewater from toilets, urinals, kitchen sinks, dishwashers or laundry from soiled diapers.

Storm water is precipitation discharged across land to water or through conveyances to one or more waterways. It may include storm water runoff, snow melt runoff, surface runoff and drainage.

3. Who regulates reclaimed water in Virginia to protect human health and the environment?

The Department of Environmental Quality (DEQ) regulates the reclamation and reuse of wastewater in accordance with the Water Reclamation and Reuse Regulations, 9VAC25-740-10 et seq. (<http://lis.virginia.gov/000/reg/TOC09025.HTM#C0740>).

The Virginia Department of Health provides guidelines for the recycle and use of gray water (http://www.vdh.virginia.gov/EnvironmentalHealth/ONSITE/gmp/documents/2011/pdf/GMP_99A.pdf) and for the use of harvested rainwater (http://www.vdh.virginia.gov/EnvironmentalHealth/ONSITE/gmp/documents/2011/pdf/GMP_154.pdf).

The Department of Conservation and Recreation regulates the reclamation and reuse of stormwater in accordance with the Virginia Stormwater Management Program Permit Regulations, 4VAC50-60-10 et seq. (<http://lis.virginia.gov/000/reg/TOC04050.HTM#C0060>).

4. What treatment is required to reclaim wastewater for reuse?

Generally, the greater the potential for public contact with reclaimed water, the greater will be the degree of treatment and disinfection needed for that water.

Reclaimed water may be produced from two kinds of wastewater, municipal and industrial. For municipal wastewater, there are two sets of treatment standards referred to as Level 1 and Level 2. Reclaimed water meeting Level 1 standards is more highly treated and disinfected, and suitable for reuse with potential for public contact. Reclaimed water meeting Level 2 standards is not as highly treated and disinfected as Level 1 reclaimed water and is suitable for reuses where there is little or no potential for public contact.

Treatment required to reclaim industrial wastewater depends on the types of pollutants in the wastewater and the potential for public contact with the reuses of that water. Reclaimed water treatment standards for industrial wastewater will be determined on a case by case basis.

5. How can reclaimed municipal water be reused?

Water reclaimed from municipal wastewater may be reused in a variety of ways. The table below lists acceptable reuses of reclaimed municipal wastewater that meets Level 1 and Level 2 standards.

Reuses of Reclaimed Water	
Level 1 Reclaimed Water	Level 2 Reclaimed Water
<p>All types of landscape irrigation in public access areas (i.e., golf courses, cemeteries, public parks, school yards and athletic fields)</p> <p>Non-residential toilet flushing</p> <p>Fire fighting or protection and fire suppression in non-residential buildings</p> <p>Outdoor domestic or residential reuse (i.e., lawn watering and non-commercial car washing)</p> <p>Commercial car washes</p> <p>Commercial air conditioning systems</p> <p>Irrigation for any food crops not commercially processed, including crops eaten raw</p> <p>Landscape impoundments with potential for public access or contact</p> <p>Commercial laundries</p>	<p>Irrigation for any food crops commercially processed</p> <p>Irrigation for non-food crops and turf, including fodder, fiber and seed crops; pasture for foraging livestock; sod farms; ornamental nurseries; and silviculture</p> <p>Landscape impoundments with no potential for public access or contact</p> <p>Soil compaction</p> <p>Dust control</p> <p>Washing aggregate</p> <p>Making concrete</p> <p>Livestock watering</p> <p>Aquaculture</p> <p>Stack scrubbing</p> <p>Street washing</p> <p>Boiler feed</p> <p>Ship ballast</p> <p>Once-through cooling</p> <p>Recirculating cooling towers</p>

Some reuses of reclaimed municipal wastewater listed above may have additional restrictions. Other reuses not listed above may be approved by DEQ on a case-by-case basis.

6. How can reclaimed industrial wastewater be reused?

There are many different types of industries capable of producing wastewater containing pollutants that differ from one industry to the next and from pollutants contained in municipal wastewater. In most cases, it will be possible to reclaim industrial wastewater for reuses, such as those listed in the table above. However, the treatment needed to reclaim industrial wastewater may be different than the treatment needed to reclaim municipal wastewater for the same reuse, and would be determined on a case-by-case basis.

7. Can reclaimed water be reused for drinking water?

In Virginia, reclaimed water cannot be sent directly to a drinking water distribution system for human consumption. Reclaimed water can only be used for drinking water when it is discharged to and combined with a surface water, such as a lake or stream, that is used for drinking water supply. After mixing, the combined reclaimed and surface water can be withdrawn, treated to meet drinking water standards and then distributed. This is referred to as indirect potable reuse.

The level of treatment required for indirect potable reuse is more stringent than Level 1 or Level 2 treatment standards for the reclamation of municipal wastewater. Currently, Virginia has one facility which is permitted to produce reclaimed water that is used for drinking water in this manner. This facility has been operating successfully for more than twenty years.

8. Is a permit required to reuse reclaimed water?

Facilities that generate and distribute water reclaimed from domestic, municipal or industrial wastewater require permits from the DEQ. End users, or persons and entities that reuse reclaimed water received directly from a facility that generates or distributes it, do not require a permit in most cases. However, end users are required to have a service agreement or contract with their reclaimed water provider, similar to other agreements required by utility companies, such as for sewerage service.

9. What will reclaimed water cost?

In states where water reuse is well established, such as California and Florida, the cost of reclaimed water to end users is less than or equal to the cost of drinking water. The cost of reclaimed water to end users in Virginia is expected to follow the same pricing trends to encourage reuse of reclaimed water.

10. Why reuse reclaimed water?

Water reuse can offer several potential benefits by:

- Conserving drinking water, the highest quality water, for human consumption
- Supplementing a community's overall water supply for other uses
- Providing an alternative affordable water source to end users that is less than or equal to the cost of drinking water
- Delaying the need for and cost of new or expanded drinking water resources and infrastructure

- Reducing the amount and cost of commercial fertilizer applied to sites irrigated with reclaimed water that contains nitrogen and phosphorus
- Ensuring a more reliable water supply where used in combination with other options to diversify a community's water supply resources

11. How does the Virginia DEQ ensure that water reclamation and reuse projects protect the environment and public health?

When reclaimed water is properly treated, managed and reused for its intended purpose, it is safe for the environment and public health.

Generators of reclaimed water produced from domestic, municipal or industrial wastewater are required to obtain a permit from the DEQ. The permit requires regular monitoring and reporting to verify compliance with appropriate reclaimed water standards.

Cross connection and back flow prevention programs are required for reclaimed water distribution systems. These programs must describe measures to prevent reclaimed water from entering drinking water supply lines and to prevent contamination of the reclaimed water distribution system by backflow. In addition, pipelines and associated equipment of reclaimed water distribution systems are required to have identification and labeling that distinguish them from other pipelines, including drinking water distribution pipelines.

Reclaimed water has been reused successfully in the United States for over twenty years, particularly in Florida, California and dry southwest states.

12. Where can I find more information about water reclamation and reuse?

More specific information regarding the regulation of water reclamation and reuse in Virginia and possible funding for publicly-owned water reclamation and reuse projects is available on DEQ's Water Reclamation and Reuse Program Page at

<http://www.deq.virginia.gov/Programs/Water/LandApplicationBeneficialReuse/WaterReclamationReuse.aspx>.

General information about water reclamation and reuse can be obtained from the WaterReuse Association at <http://www.watereuse.org/>. The U.S. EPA also has a very informative publication entitled *Guidelines for Water Reuse* (2004) that can be downloaded at no cost from

<http://www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.htm>.